

Work Order ID 57323

April 6, 2010 1:20:54 PM



Page 1

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Item Name: Skidtube LH

Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: *PA*

Date: *10-4-06* Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D2904	Rev B								

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPPD315-668-011

CHG 001

STOP

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DCA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries.

Work Order ID 57323

April 6, 2010 1:20:54 PM



Page 2

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Item Name: Skidtube LH

Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	----------------	--------------	--------------	---------------	---------------	------------------	----------------

110

0.00



Skidtubes

Skidtubes

Memo

0.00

Skidtubes

LANDING GEAR RESOURCE 1

1-Cut D2904b to length as per dwg D2904

M 10/4/14

2-Drill aft and fwd cap holes as per dwg D2904 using DT8025 jig
(DO NOT OPEN TO FINISH SIZE)3-Drill saddle holes (6 Deg) as per Dwg D2904 using DT8938A jig
(ENSURE THAT LOCATOR RING IS SET FOR LH TUBE)4-Drill GHW holes (3 Deg) as per Dwg D2904 using DT8938B jig
(ENSURE THAT LOCATOR RING IS SET FOR LH TUBE)5-Insert and cleco doublers and DT8938d in position. Transfer all 256 holes thru
tube and doublers.

6-Remove doublers and identify batch# and orientation

7-C'sink Rivet holes 256 places as per Dwg D2904 and deburr

M 10/4/19

8-Locate from saddle holes, drill wearplate holes using DT8994. Jig must be 1.7"
from aft end of tube (REF)

BE 10/04/19

9-Remove fwd and aft indexing ridges as per dwg D2904. Open fwd and aft cap
holes to finish size, scribe batch# at aft end of tube.

M 10/4/19

10-Remove marks left from drill jig and deburr

BE 10/04/19

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DOA: _____ Date: _____







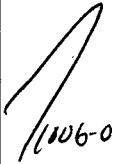
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

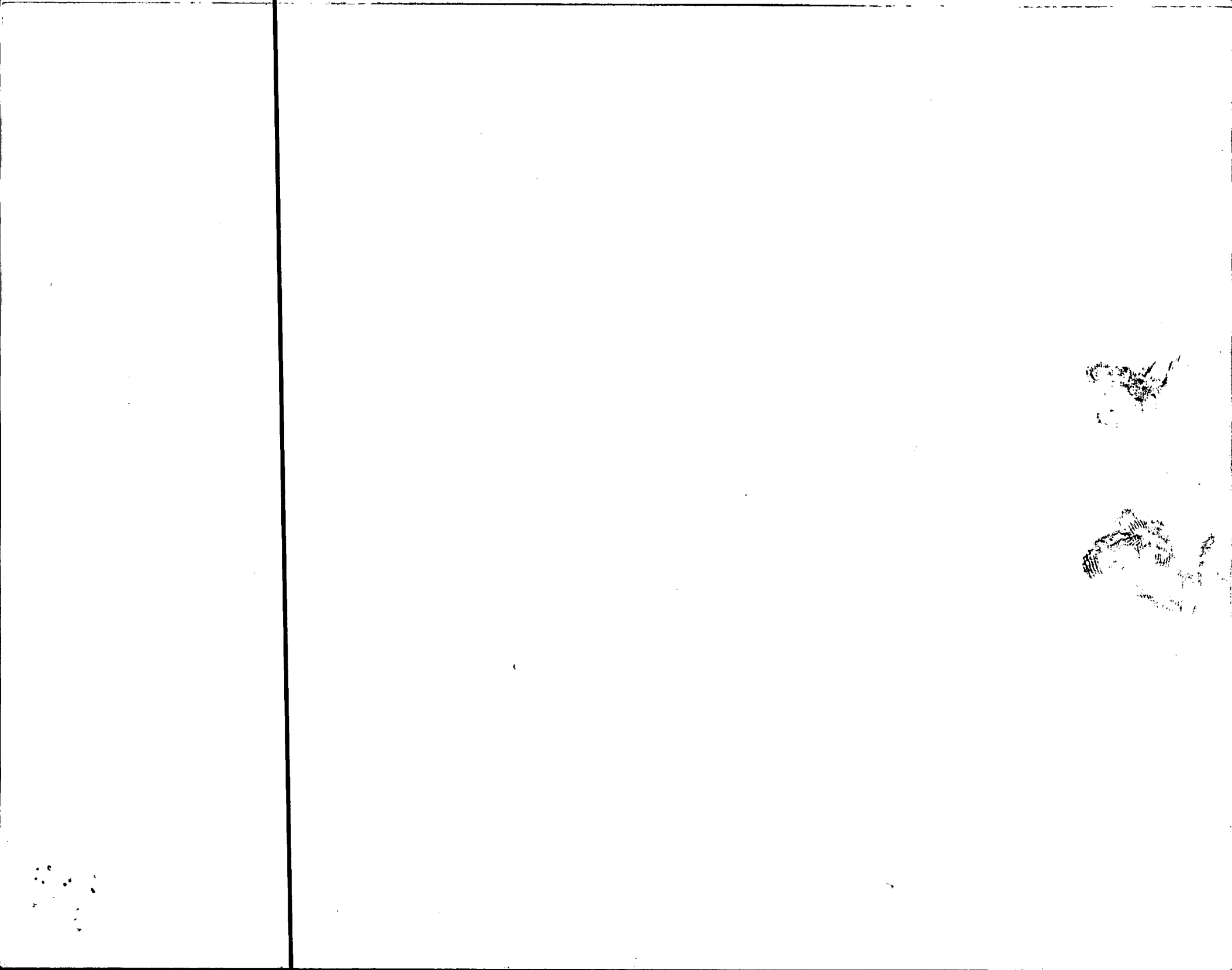
NOTE: Date & initial all entries

W/O		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D315-668-011 PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: 7 Date: 1008-05
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR: 57323		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10.04.19	110	MS20501AD403 RIVETS ARE BREAKING DURING INSTALLATION	 10.04.19 per OSI 042	USE CR3217 CR3217-4-03 RIVETS. FSHEAR = 240lb FOR MS20501 FSHEAR = 664lb FOR CR3217	 10-4-29	8 10/05/13	 10.04.19 per OSI 042	8 10/05/13
10.05.20	110	WEARSHOE HOLES OFF BY 12°. WRONG SIG USED. NO LH SIG EXISTS Re: Boly - NCR 10-073	 OSI 042	SCRAP TUBE. CAN'T WELD- CRITICAL AREA. CP 10.05.20	BE 10/08/23	 10-8-3	 10/05/20	 11/06-09

NOTE: Date & initial all entries



CHERRYMAX® RIVET SELECTION

MECHANICAL PROPERTIES

Materials		Ultimate	Maximum
Sleeve	Stem	Shear Strength	Temperature
5056 Aluminum	Alloy Steel	50,000 PSI	250°F
5056 Aluminum	CRES	50,000 PSI	250°F
Monel	CRES	75,000 PSI	900°F
Inco 600	Inco X-750	75,000 PSI	1400°F

MINIMUM RIVET SHEAR & TENSILE STRENGTH (LBS.) IN STEEL COUPONS

RIVET DIAM.	SHEET THICK.	SINGLE SHEAR					TENSILE						
		ALUMINUM		MONEL		INCO	ALUMINUM		MONEL		INCO		
		Nom.	O/S	Nom.	O/S	O/S	Nom.	O/S	Nom.	O/S	O/S		
		3212	3242	3522	3552	3852	3212	3214	3242	3522	3524	3552	3852
		3213	3243	3523	3553	3853	3213	3224	3243	3523		3553	3853
		3214	3245	3524	3555		3222		3245			3555	
		3222	3246		3556		3223		3246			3556	
		3223	3252						3252				
		3224	3253						3253				
			3255						3255				
1/8 (-4)	2x.156	664	814	995	1220	1220	285	250	345	400	360	490	570
5/32 (-5)	2x.187	1030	1245	1545	1865	1865	445	390	530	635	555	740	860
3/16 (-6)	2x.219	1480	1685	2215	2525	2525	635	560	710	890	800	1000	1160
1/4 (-8)	2x.281	2615	2925	3920	4390	4390	1125	1000	1260	1570	1410	1755	2030

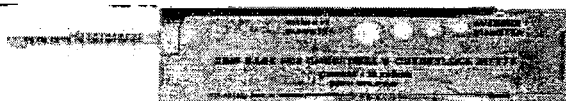
Values shown are fastener capabilities only. Design values will be limited by the bearing strength of the sheet material used.

GAGES

269C3 GRIP GAGE

NATIONAL STOCK NUMBER 5210-00-255-7544

A simple, self-explanatory gage for determining material thickness and proper rivet grip length.



T-172 RIVET HOLE SIZE GAGE

These are precision ground, go no-go gages used to check holes drilled for CherryMAX® rivets. They are made in both nominal and oversize rivet diameters.



RIVET DIAMETER	GAGE NUMBER	NATIONAL STOCK NO.	RIVET DIAMETER	GAGE NUMBER	NATIONAL STOCK NO.
1/8" Nominal	T-172-4	5220-00-478-4135	1/8" Oversize	T-172-400	5220-00-478-4137
5/32" Nominal	T-172-5	5220-01-021-3276	5/32" Oversize	T-172-500	5220-00-478-4140
3/16" Nominal	T-172-6	5220-00-478-4136	3/16" Oversize	T-172-600	5220-00-478-4141
1/4" Nominal	T-172-8	5220-00-478-4139	1/4" Oversize	T-172-800	5220-01-374-1340

ATTENTION

Blind rivets are not always a suitable substitute for solid rivets. Maintenance personnel are reminded that AC 43.13-1A chapter 2, section 3 stipulates: "Do not substitute hollow rivets for solid rivets in load carrying members without specific approval of the application by a representative of the Federal Aviation Administration. Blind rivets may be used in blind locations in accordance with the conditions listed in Chapter 5, provided the edge distances and spacings are not less than the minimum listed in paragraph 99d."

Work Order ID 57323

April 6, 2010 1:20:54 PM



Page 3

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Item Name: Skidtube LH

Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

120

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

130

Chemical Conversion Coat per QSI005 4.1

0.00



HandFinish

Memo

0.00

Hand Finishing

140

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

8/10/04/20

SEE NCR

DP

10-4-23

1 M 10/4/23

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID: 57323

April 6, 2010 1:20 PM



Page 4

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Item Name: Skidtube LH

Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150



Skidtubes

Skidtubes

Skidtubes

Memo

0.00

LANDING GEAR RESOURCE 1

1-Remove alodine around X-Bolt holes on doublers

2-Rivet doublers as per Dwg D2904.(DO NOT INSTALL RIVETS AROUND X-BOLT HOLES AT THIS TIME)

3-Open X-Bolt spacer holes to finish size as per dwg D2904.(DO NOT USE CUTTING FLUID)

4-C'sink and deburr X-Bolt spacer holes, prepare for Welding.

5-Blow all chips from inside tube

6-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting

Pick:

Qty ☐ Part Number ☐ Description ☐ Batch
A/R ☐ ☐ Sikaflex-291 ☐ M112929 ☐

Sikaflex expire date: 12/31/10

Start Time: 11:00 AM Date: 4/5/10

Fin Time: _____ Date: _____

[Handwritten signature]

10-4-28

4/10/5/10

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 57323

April 6, 2010 1:20:54 PM



Page 5

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Item Name: Skidtube LH

Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

160



Skidtubes

0.00

Skidtubes

Memo

0.00

Skidtubes

LANDING GEAR RESOURCE 1

1-Weld crossbolt spacers D2909as per Dwg. D2904and QSI 004.
For D2579 spacers, weld one side, pass Y" drill, weld other side, pass Y" drill
A/R□□□ Aluminum Rod *M112507*

2-Grind welds as per Dwg D2909

3-Install remaining rivets around X-Bolt spacer , use rivet shaver as necessary

4-Deburr,inspect tube for any visible scratches

*BE 10/05/11**11/05/13*

170



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

*8/06/13**QD*

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 57323

April 6, 2010 1:20:54 PM



Page 6

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Item Name: Skidtube LH

Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180

QC10- Inspect visual per QSI004- ground welds

0.00



QC

Memo

0.00

Quality Control

8.12.10/13

(2)

190

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

200

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00



Powdercoat

Memo

0.00

Powder Coating

POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

START TIME: _____

OVEN TEMPERATURE: _____

FINISH TIME: _____

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

Work Order ID 57323

April 6, 2010 1:20:54 PM

Page 7

Item ID: D315-668-011

Accept

Revision ID:

Item Name: Skidtube LH

Start Date: 06/04/2010 Start Qty: 1.00

Required Date: 16/04/2010 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev. Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

220

HandFinishing

0.00



HandFinish

Memo

0.00

Hand Finishing

HAND FINISHING RESOURCE #1

1-Install inserts & wearplates as per Dwg. D2904. Use a drop of Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐ _____ ☐ ☐ ☐

Sikaflex expire date: _____

3-Inspect for foreign object per QSI 024

4-Install 2646 Aft & fwd Caps as per Dwg D2904 and seal with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐ _____ ☐ ☐ ☐

Sikaflex expire date: _____

5-Wing Walk as per Dwg D2904 and QSI 005

4.4

Batch: _____

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 57323

April 6, 2010 1:20:54 PM



Page 8

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Stop



Item Name: Skidtube LH

Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start



QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev. Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

230



QC5- Inspect part completeness to step on W/O

0.00

QC

Memo

0.00

Quality Control

240



Identify as per dwg & Stock Location: _____

0.00

Packaging

Memo

0.00

Packaging

250



QC21- Final Inspection - Work Order Release

0.00

QC

Memo

0.00

Quality Control

MF 10-8-04

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

Picklist Print

April 6, 2010 1:20:58 PM

Page 1

Work Order ID: 57323

Parent Item: D315-668-011

Parent Item Name: Skidtube LH



Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified
by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2904B		Manufactured	No			110	Each	2.0000	1.0000			
												
Skidtube, 315												

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

LG

2

31826

1

36926

1

D2910

Manufactured No

110

Each

44.0000

2.0000



Doubler



Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST030

44

36927

44

D2911

Manufactured No

110

Each

53.0000

2.0000



Doubler



Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST030

53

36928

53



10-4-14

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April 6, 2010 1:20:58 PM

Page 2

Work Order ID: 57323

Parent Item: D315-668-011

Parent Item Name: Skidtube LH


Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified
by:EC

Start Date: 06/04/2010


Required Date: 16/04/2010

Start Qty: 1.00


Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
MS27039-1-08		Purchased	No			110	Each	1,958.000	54.0000			
												
Screw												

Warehouse	Loc Qty	Loc Code
Location		
Main Warehouse		
ST291	1958	
110552	44	
110835	1914	

D2912	Manufactured	No				150	Each	40.0000	2.0000			
												
Doubler												

Warehouse	Loc Qty	Loc Code
Location		
Main Warehouse		
ST030	40	
36929	40	
	150	

MS20601-AD4W3	Purchased	No					Each	228.0000	256.0000			
												
Rivet												

Warehouse	Loc Qty	Loc Code
Location		
Main Warehouse		
ST322	228	
111359	28	
113899	200	

CR3212-4-03
M112314 (28)
M114436
M114400 (55)

(174)

* See attached E-Mail

DP 10-4-14

DP 10-4-29

April 6, 2010 1:20:58 PM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April 6, 2010 1:20:58 PM

Page 3

Work Order ID: 57323

Parent Item: D315-668-011

Parent Item Name: Skidtube LH



Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2905		Manufactured	No			160	Each	0.0000	1.0000			
												
Web, 315 Skidtube												
ALS4-1032-130	Purchased		No			220	Each	40.0000	50.0000			
												
Insert												

357333

1

4/10/5/6

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST282

40

110511

40

AN960JD10L

Purchased

No

220

Each

4,693.000

54.0000



Washer

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST348

4693

110985

4693

April 6, 2010 1:20:58 PM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April 6, 2010 1:20:58 PM

Page 4

Work Order ID: 57323

Parent Item: D315-668-011

Parent Item Name: Skidtube LH





Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified
by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status																																
D2646		Manufactured	No			220	Each	35.0000	2.0000																																			
																																												
Aft Cap																																												
<table><tr><th><u>Warehouse</u></th><th><u>Loc</u></th><th><u>Qty</u></th><th><u>Loc Code</u></th></tr><tr><td colspan="4"><u>Location</u></td></tr><tr><td>Main Warehouse</td><td></td><td></td><td></td></tr><tr><td>FP6</td><td>28</td><td></td><td></td></tr><tr><td>52663</td><td>28</td><td></td><td></td></tr><tr><td>Main Warehouse</td><td></td><td></td><td></td></tr><tr><td>fp7</td><td>7</td><td></td><td></td></tr><tr><td>52663</td><td>7</td><td></td><td></td></tr></table>													<u>Warehouse</u>	<u>Loc</u>	<u>Qty</u>	<u>Loc Code</u>	<u>Location</u>				Main Warehouse				FP6	28			52663	28			Main Warehouse				fp7	7			52663	7		
<u>Warehouse</u>	<u>Loc</u>	<u>Qty</u>	<u>Loc Code</u>																																									
<u>Location</u>																																												
Main Warehouse																																												
FP6	28																																											
52663	28																																											
Main Warehouse																																												
fp7	7																																											
52663	7																																											
D2648-3		Manufactured	No			220	Each	40.0000	5.0000																																			
																																												
Wearpad																																												
<table><tr><th><u>Warehouse</u></th><th><u>Loc</u></th><th><u>Qty</u></th><th><u>Loc Code</u></th></tr><tr><td colspan="4"><u>Location</u></td></tr><tr><td>OFFSHORE</td><td></td><td></td><td></td></tr><tr><td>FG</td><td>12</td><td></td><td></td></tr><tr><td>45316</td><td>12</td><td></td><td></td></tr><tr><td>Main Warehouse</td><td></td><td></td><td></td></tr><tr><td>FP17</td><td>28</td><td></td><td></td></tr><tr><td>52516</td><td>28</td><td></td><td></td></tr></table>													<u>Warehouse</u>	<u>Loc</u>	<u>Qty</u>	<u>Loc Code</u>	<u>Location</u>				OFFSHORE				FG	12			45316	12			Main Warehouse				FP17	28			52516	28		
<u>Warehouse</u>	<u>Loc</u>	<u>Qty</u>	<u>Loc Code</u>																																									
<u>Location</u>																																												
OFFSHORE																																												
FG	12																																											
45316	12																																											
Main Warehouse																																												
FP17	28																																											
52516	28																																											

April 6, 2010 1:20:58 PM

Shop Packet Print

Page 4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April 6, 2010 1:20:58 PM

Page 5

Work Order ID: 57323



Parent Item: D315-668-011



Parent Item Name: Skidtube LH

Start Date: 06/04/2010

Required Date: 16/04/2010

Comments: IPP Rev:A New Issue 07-04-12 JLM
 IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified
 by:EC

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2656-13		Manufactured	No			220	Each	15.0000	1.0000			



Wearplate

Warehouse	Location	Loc Qty	Loc Code
Main Warehouse			
	FP20	12	
	55454	12	
Main Warehouse			
	MEZZ	3	
	44158	3	

D2656-33

Manufactured No

220

Each

22.0000

1.0000



Wearplate

Warehouse	Location	Loc Qty	Loc Code
Main Warehouse			
	MEZZ	22	
	43806	9	
	46167	13	

April 6, 2010 1:20:58 PM

Shop Packet Print

Page 5

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April 6, 2010 1:20:58 PM

Page 6

Work Order ID: 57323



Parent Item: D315-668-011



Parent Item Name: Skidtube LH

Start Date: 06/04/2010

Required Date: 16/04/2010

Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified
by:EC

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ D2907	Replacement	Mfg/ Manufactured	Bin No	Primary	Last	Route 220	Unit of Each	Qty on 32.0000	Remaining 1.0000	Qty	Date	Status
Wearshoe												

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

FP

32

14654

32

D2909

Manufactured

No

220

Each

129.0000

11.0000



Spacer, Lama

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

LG

129

12947

13

14091

116

11 BE 10/05/11

April 6, 2010 1:20:58 PM

Shop Packet Print

Page 6

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE USA, INC. BELLEVUE, WA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2904	Rev. B SHEET 1 OF 3
DATE 00.06.21		TITLE SA 315B SKIDTUBE ASSEMBLY	SCALE NTS
A	99.09.09	NEW ISSUE	
B	00.06.21	CHANGED ANGLES FOR HOLES	

PARTS LIST:

Qty -041	Qty -042	Part Number	Description
X		D2904-041	LH SKIDTUBE ASSEMBLY
	X	D2904-042	RH SKIDTUBE ASSEMBLY
2	2	D2646	CAP
4	4	D2648-3	WEARPAD
1	1	D2648-5	WEARPAD
1	1	D2656-13	WEARSHOE
1	1	D2656-33	WEARSHOE
1		D2904-1	SKIDTUBE
	1	D2904-2	SKIDTUBE
1	1	D2905	WEB
1	1	D2907	WEARSHOE
11	11	D2909	CROSS BOLT SPACER
2	2	D2910	SKIDTUBE DOUBLER
2	2	D2911	SKIDTUBE DOUBLER
2	2	D2912	SKIDTUBE DOUBLER
50	50	ALS7-1032-130 or AKS4-1032-130 or ALS4-1032-130 or ALS7-1032-130	INSERT
54	54	AN960JD10L	WASHER
256	256	MS20601AD4W3	RIVET
54	54	MS27039-1-08	SCREW

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 57323

10-11-05

RELEASED
00.07.01 *[Signature]*

Copyright © 1999 by DART AEROSPACE USA, INC.

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.

W/O:			WORK ORDER CHANGES					
DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE USA, INC. BELLEVUE, WA	
CHECKED <i>#</i>	APPROVED <i>#</i>	DRAWING NO. D2904	Rev. B SHEET 2 OF 3
DATE 00.06.21		TITLE SA 315B SKIDTUBE ASSEMBLY	SCALE 1:20

GENERAL NOTES:

- W/O 57323*
1. TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
 2. MAKE D2904-1 AND D2904-2 FROM D2914 EXTRUSION (INITIAL LENGTH = 142.0).
 3. DAMAGE TOLERANCE ON BENDING:
THERE SHOULD BE NO VISIBLE WRINKLES IN THE BEND FROM THE GROUND TO A HEIGHT OF 7 INCHES ABOVE THE GROUND. NO GOUGING IS ACCEPTABLE IN THE FLAT PORTION OF THE TUBE. GOUGES UP TO 0.020 ARE ACCEPTABLE IN THE BENT PORTION OF THE TUBE. TUBE O.D. SHOULD BE 3.150 ± 0.010 IN THE FLAT PORTION OF THE TUBE. A MAXIMUM REDUCTION IN DIAMETER OF 0.150" IS ACCEPTABLE IN THE BENT PORTION OF THE TUBE.
 4. ALL HOLES DRILLED ON CENTERLINES EXCEPT THOSE NOTED BY SECTION C-C.
 5. DRILL #30 HOLES ($\varnothing 0.128$ REF) TO LINE UP WITH $\varnothing 0.128$ HOLES IN D2910/D2911/D2912 DOUBLERS. C'SINK $\varnothing 0.239 \times 100^\circ$.
 6. BOND D2905 WEB INTO D2904-1 (OR D2904-2) OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241/291 ADHESIVE PER DART QSI 015. ENSURE HOLES LINE-UP.
 7. WELDING TO BE DONE PER DART QSI 004.
 8. AFTER DRILLING, BENDING, AND INSTALLING WEB & DOUBLERS, PERFORM THE FOLLOWING FOR $\varnothing 0.500$ HOLES ONLY:
 - CHAMFER HOLE $0.050 \times 45^\circ$
 - INSERT D2909 SPACER (11 PLACES)
 - WELD INTO PLACE
 - GRIND FLUSH
 - DRILL OUT SPACER TO $\varnothing 0.406$
 9. FINAL CONFIGURATION SHOULD HAVE THE FOLLOWING MINIMUM MECHANICAL PROPERTIES:
 - MINIMUM YIELD TENSILE STRENGTH = 35 ksi
 - MINIMUM ULTIMATE TENSILE STRENGTH = 38 ksi
 10. FINISH:
 - ACID ETCH, ALODINE ASSEMBLY PER DART QSI 005 4.1 PRIOR TO INSTALLING D2905 WEB AND D2910/D2911/D2912 DOUBLERS.
 - POWDER COAT WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3
 - BLACK ANTI-SKID PAINT AS INDICATED TO 1.0 ABOVE SKIDTUBE CENTER-LINE PER DART 005 4.4 (OPTIONAL).
 11. DRILL $\varnothing 0.297$ FOR ALS7-1032-130 INSERT USING DT8395 BEFORE FINISH. INSTALL ALS7-1032-130 INSERTS AFTER FINISH.

RELEASED
00.09.01 *#*

Copyright © 2000 by DART AEROSPACE USA, INC.

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.

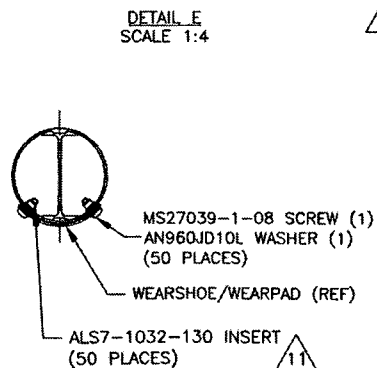
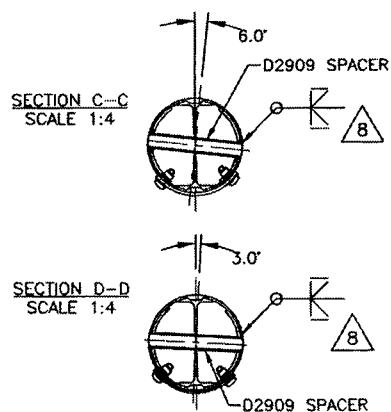
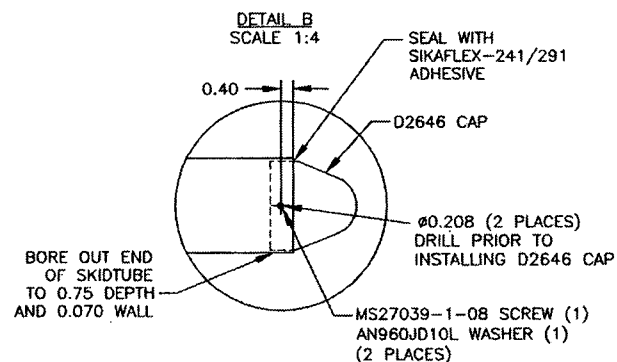
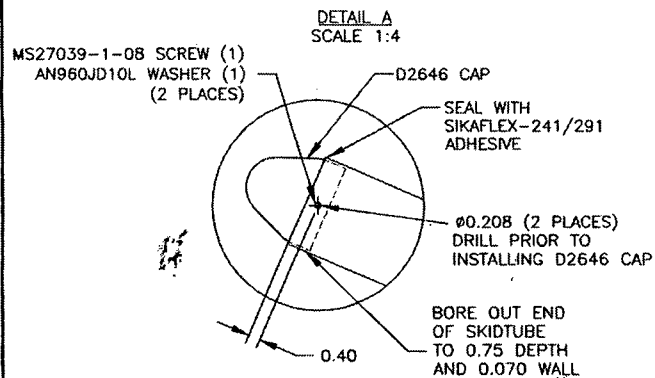
W/O:			WORK ORDER CHANGES					
DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

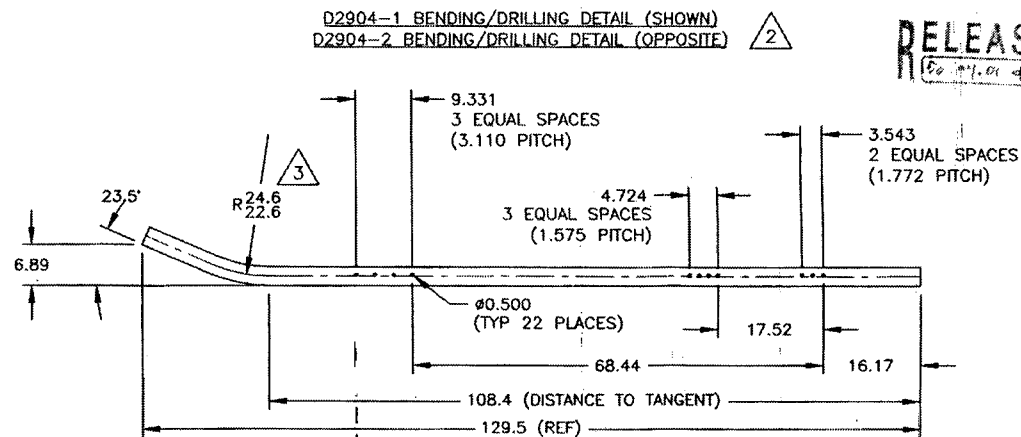
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:			WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP		Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
				Initial Chief Eng	Action Description Chief Eng	Sign & Date			

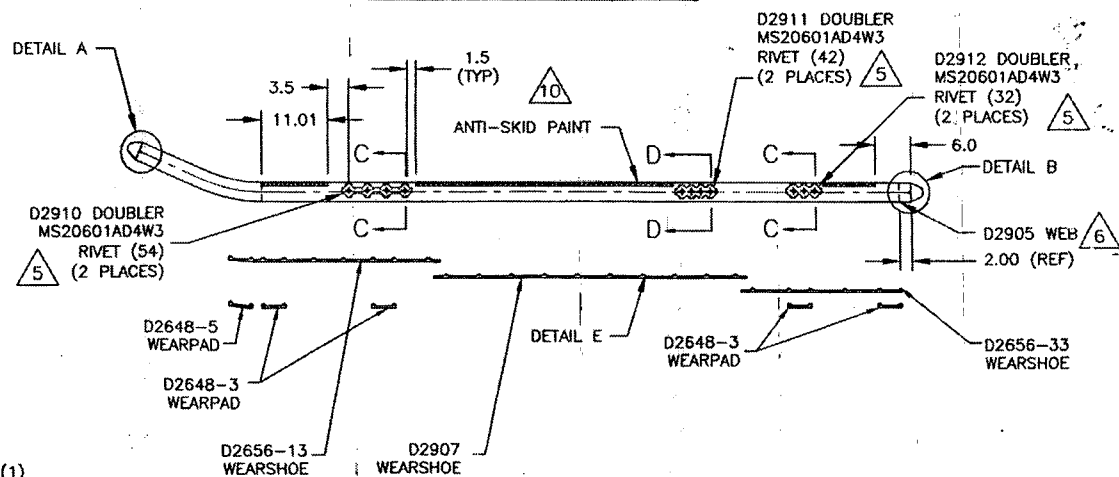
NOTE: Date & initial all entries



D2904-1 BENDING/DRILLING DETAIL (SHOWN)
D2904-2 BENDING/DRILLING DETAIL (OPPOSITE)



D2904-041 LH ASSEMBLY DETAIL (SHOWN)
D2904-042 RH ASSEMBLY (OPPOSITE)



COPYRIGHT © 2000 BY DART AEROSPACE USA, INC.

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL
AND IS SUPPLIED ON THE EXPRESS CONDITION
THAT IT IS NOT TO BE USED FOR ANY PURPOSE
OR COPIED OR COMMUNICATED TO ANY OTHER
PERSON WITHOUT WRITTEN PERMISSION FROM
DART AEROSPACE USA, INC.

DESIGN CP	DRAWN BY CP	DART DART AEROSPACE USA, INC. BELLINGHAM, WA	REV. B
CHECKED #	APPROVED #	DRAWING NO. D2904	SHEET 3 OF 3
DATE 00.06.21	TITLE SA 315B SKIDTUBE ASSEMBLY	SCALE 1:20	

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO. 152

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliot
Job number: B36899
Part number: A315668011
Description: Skid tube (Lamer)
Welding Process: Tig[☒] Mig[]
Base material: Aluminum
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier David Good Date of Test Coupon 08/04/24

Welder Barclay Elliot Date of Test Coupon 08/04/24

The above named individual is qualified in accordance with AWS D17.1.2001 to weld